

Appln. No. 09/681,891

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Attorney Docket No. 13376-138

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1-13. (canceled)

14. (currently amended) A method of manufacturing a thick film heater comprising a heating element applied directly to a surface of a target object, the method comprising the steps of:

applying the heating element, comprising a thick film resistive circuit, directly to the surface of the target object, wherein the thick film resistive circuit is made of a polymer-based ink;

thermally curing the heating element at a temperature in excess of 150 °C for a first period of time in excess of thirty minutes in a standard curing cycle; and

sealing the heating element with a dielectric layer; and

thermally post-curing the heating element and the dielectric layer for second a period of time in a post-curing cycle, the second period of time being longer than the first period of time.

15. (canceled)

16. (currently amended) The method of claim 14 further comprising the step of preparing the surface of the target object with a lower dielectric layer, and wherein

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the heating element in said applying layer step is applied over the lower dielectric layer.

17. (currently amended) The method of claim 14 wherein said curing step in said standard curing cycle occurs at a temperature of 200 °C or greater.

18. (currently amended) The method of claim 14 wherein said first period of time curing step occurs for a period of two hours or longer.

19. (original) The method of claim 14 wherein the heating element is designed to operate at greater than 15 W/cm².

20. (original) The method of claim 14 wherein the target object is non-ferrous.

21. (original) The method of claim 20 wherein the target object is aluminum.

22. (original) The method of claim 19 wherein the target object is copper.

23. (original) The method of claim 20 wherein the target object is ceramic.

24. (currently amended) The method of claim ~~[[13]]~~ 14 wherein the target object ~~[[is]]~~ comprises high-expansion steel.

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25. (currently amended) The method of claim ~~[[13]] 14~~ wherein ~~the polymer base~~ polymer-based ink of the thick film resistive circuit ~~[[is]]~~ comprises an epoxy.

26. (original) The method of claim 24 wherein the polymer-based ink contains silver particles.

27. (new) A thick film heater comprising:

a target object to be heated;

a heating element comprising a polymer-based electrically thick film resistive circuit, the heating element being applied to a surface of the target object, the heating element being thermally cured for a first period of time in a standard curing cycle; and

a dielectric layer applied over the heating element, the heating element and the dielectric layer being thermally cured for a second period of time in a post-curing cycle, the second period of time being longer than the first period of time.

28. (New) The thick film heater of claim 27, wherein the first period of time is at least thirty minutes and the second period of time exceeds sixty minutes.

29. (New) The thick film heater of claim 27, wherein the heating element is cured in the standard curing cycle at a temperature of at least 150 °C, and wherein the heating element and the dielectric layer are cured in the post-curing cycle at a temperature of at least 200 °C.

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30. (New) The thick film heater of claim 29, wherein the second period of time is at least two and a half hours.

31. (New) The thick film heater of claim 30, wherein the second period of time is at least four hours.

32. (New) The thick film heater of claim 28, wherein the heating element is cured in the standard curing cycle at a temperature of at least 150 °C, the heating element and the dielectric layer are cured in the post-curing cycle at a temperature of at least 150 °C, and the second period of time is at least three hours.

33. (New) The thick film heater of claim 29, wherein the heating element and the dielectric layer are cured in the post-curing cycle at a temperature of at least 225 °C, and the second period of time is at least two hours.

34. (New) The thick film heater of claim 27, wherein the heating element is capable of heat flux at least as great as 200 Watts per square inch.

35. (New) The thick film heater of claim 27, wherein the target object is non-ferrous.

36. (New) The thick film heater of claim 35, wherein the target object is comprised of a material selected from the group consisting of: aluminum, copper, and ceramic.

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37. (New) The thick film heater of claim 27, wherein the target object comprises high-expansion steel.

38. (New) The thick film heater of claim 27, wherein the heating element further comprises a base dielectric layer disposed between the target object and the electrically resistive circuit.

39. (New) The thick film heater of claim 38, wherein the base dielectric layer consists of a metal oxide selected from the group consisting of TiO_2 , SiO_2 , and Al_2O_3 .

40. (New) The thick film heater of claim 14, wherein the curing step occurs at a temperature of at least 150°C , and the first time period is at least thirty minutes.

41. (New) The method of claim 40, wherein the post-curing step occurs at a temperature of at least 200°C .

42. (New) The method of claim 41, wherein the second period of time exceeds sixty minutes.

43. (New) The method of claim 41, wherein the second period of time is at least two and a half hours.

44. (New) The method of claim 41, wherein the second period of time is at least four hours.

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45. (New) The method of claim 40, wherein the post-curing step occurs at a temperature of at least 150 °C, and the second period of time is at least three hours.

46. (New) The method of claim 41, wherein the post-curing step occurs at a temperature of at least 225 °C, and the second period of time is at least two hours.

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